
New Species of *Miconia* (Melastomataceae) from Costa Rica

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ABSTRACT. Two new Costa Rican species of *Miconia*, *M. friedmaniorum* and *M. pendula*, are described and compared with their probable relatives. Discussions, distributional notes, and diagnostic illustrations are provided for each species.

Collecting activity in the mid-elevation montane forests of Costa Rica continues to yield new and unusual species of *Miconia*. Of the approximately 98 taxa of *Miconia* known from Costa Rica, 12 now appear to be endemic to the country.

Shared floral and fruit characters suggest that the two species proposed here are closely related. Both taxa occur in wet primary forests and have similar elevational distributions, but they appear to be allopatric. *Miconia friedmaniorum* is known from the Cordillera de Tilarán and the Cordillera de Guanacaste, whereas *M. pendula* has been collected at one site in the Tapantí National Wildlife Refuge and Braulio Carrillo National Park.

Miconia friedmaniorum Almeda & Umaña, sp. nov. TYPE: Costa Rica. Alajuela: Upala, Colonia Libertad, subiendo hasta el Llano Aguacatales, 1,500 m, 10°48'25"N, 85°17'50"W, 28 Apr. 1988 (fl), *Herrera 1900* (holotype, CR; isotypes, CAS, F, MEXU, MO, PMA, USJ). Figure 1.

Arbor 2–5 m. Ramuli quadrangulati demum teretes sicut petioli foliorum subtus venae primariae inflorescentia hypanthiaque pilis asperis 0.25–0.5 mm longis erectis dense induti demum glabrati. Lamina 10.1–14.4 × 5.5–7.2 cm elliptica vel elliptico-ovata apice acuminata basi obtusa vel asymmetricè rotundato-obtusa, supra glabra, subtus in venis secundariis tertiariisque pilis asperis vel sparse caduceque granuloso-furfuracea, 5-plinervata, membranacea. Inflorescentia 5–6 cm longa multiflora; flores 5-meri, pedicellis (ad anthesim) 1–1.6 mm longis, bracteolis 0.5–1.5 × 0.5 mm persistentibus. Hypanthium (ad torum) 1.5–2 mm longum; calyx primum in cono clausus demum in lobos regulares persistentes ruptus, dentibus exterioribus 0.5–0.6 mm eminentibus. Petala 2.5–3 × 0.9–1 mm oblongo-elliptica glabra. Stamina

isomorphica glabra; antherarum thecae 1.2–1.5 × 0.3–0.5 mm angustae oblongae, poro dorsaliter inclinato; connectivum nec prolongatum nec appendiculatum. Stylus 5 mm glaber; ovarium 5-loculare et $\frac{1}{4}$ inferum apice sparsiuscule glanduloso-puberulo.

Tree 2–5 m tall, young branchlets, distal petioles, elevated primaries on the abaxial foliar surfaces, and hypanthia densely covered with inconspicuously stalked asperous-headed multicellular hairs but glabrate with age, the distal nodes sparingly beset with spreading simple multicellular hairs. Older branches somewhat quadrate to rounded with age, the nodes inconspicuously beset with interpetiolar lines or ridges. Mature leaves membranaceous, entire but varying to inconspicuously denticulate, 10.1–14.4 cm long, 5.5–7.2 cm wide, elliptic to elliptic-ovate, acuminate apically, obtuse to conspicuously oblique basally, glabrous adaxially, moderately to sparsely covered with a mixture of inconspicuously asperous-headed and scalelike multicellular hairs on the secondary and higher order veins abaxially, 5-plinerved with uppermost primaries mostly diverging from the median nerve in alternate or subalternate fashion, the secondaries conspicuous abaxially and mostly 3–6.5 mm apart; petioles 2.1–4.8 cm long, 1–1.5 mm wide. Inflorescence an erect modified cyme 5–6 cm long, commonly branched from the base, bracts of the rachis nodes paired, linear-oblong to narrowly triangular, 1.5–4 mm long, 1 mm wide, with pubescence like that of the distal branchlets, bracteoles sessile, persistent, triangular, 0.5–1.5 mm long, 0.5 mm wide, glabrous. Pedicels 1–1.6 mm long. Hypanthia (at anthesis) campanulate, 1.5–2 mm long to the torus (vascular ring). Calyx fused into a dome in young buds but rupturing at anthesis into 4 or 5 persistent broadly rounded hyaline lobes mostly 0.5–1.5 mm long and 0.5–1.1 mm wide basally; exterior calyx teeth 5, narrowly triangular, 0.5–0.6 mm long, typically exceeding the lobes, torus glabrous and undulately lobed abaxially. Petals 5, glabrous, pale pink, linear-oblong, obtuse to rounded but often

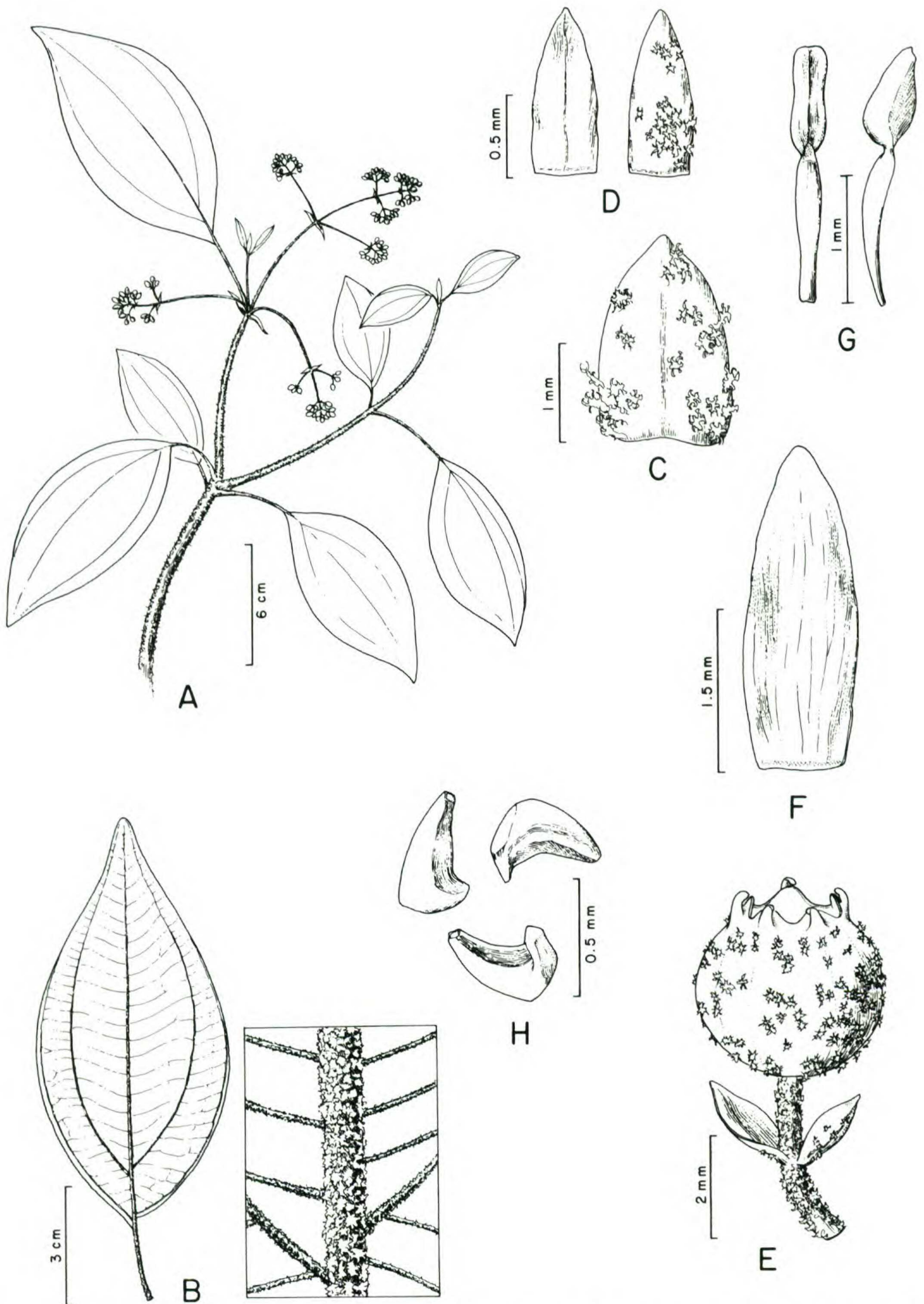


Figure 1. *Miconia friedmaniorum* Almeda & Umaña. —A. Habit. —B. Representative leaf, abaxial surface (left) and enlargement of median vein (right). —C. Floral bract (abaxial surface). —D. Bracteoles, adaxial surface (left) and abaxial surface (right). —E. Berry. —F. Petal. —G. Stamens, ventral view (left) and profile view (right). —H. Seeds. (A–G from Almeda & Anderson 5416; H from Herrera 1465.)

somewhat cucullate and superficially appearing subacute apically when dry, 2.5–3 mm long, 0.9–1 mm wide. Stamens 10, isomorphic, filaments complanate, glabrous, constricted and incurved distally, 0.8–1 mm long, 0.25–0.3 mm wide; anthers 1.2–1.5 mm long, 0.3–0.5 mm wide, yellow, linear-oblong but laterally compressed and ovate-oblong in profile view, somewhat truncate with a dorsally inclined pore; connective thickened dorsally but not prolonged or appendaged at the filament insertion. Ovary (at anthesis) $\frac{3}{4}$ inferior, 5-celled, globose, apex gently fluted, sparingly beset with glandular hairs but lacking a stylar collar. Style somewhat curved distally, glabrous, 5 mm long, 0.6 mm wide; stigma truncate and somewhat dilated. Berry globose, red turning purple when mature, 3–3.5 mm long and 3–3.5 mm diam. Seeds angular-pyramidate to somewhat crescent-shaped in profile view, beige, ca. 0.5 mm long, smooth.

Distribution. Known from the Monteverde Cloud Forest Reserve (Cordillera de Tilarán), the adjacent San Ramón Forest Reserve, and Parque Nacional Rincón de la Vieja (Cordillera de Guanacaste) in northwestern Costa Rica, where it commonly occurs in cloud forests with an Atlantic slope exposure at elevations of (900–)1,350–1,700 m.

Miconia friedmaniorum is notable for its brown pubescence, which consists of asperous-headed hairs that commonly obscure the surfaces of young branchlets, elevated primary veins on abaxial foliar surfaces and young hypanthia. These asperous-headed hairs most closely approach the dendritic hairs with short thin-walled (flattened) arms illustrated by Wurdack (1986: 64). This indument together with the basally branched cymose inflorescence, pink, linear-oblong petals, and 5-plinerved leaves with uppermost primaries diverging from the median vein in alternate fashion provide a diagnostic suite of characters distinguishing *M. friedmaniorum* from its congeners.

In overall aspect, *M. friedmaniorum* is most reminiscent of *M. pendula* (also described herein). We interpreted the first fragmentary collection of the latter taxon as a conspecific variant of *M. friedmaniorum*. However, subsequent field study and the collection of good flowering and fruiting material indicate that *M. pendula* is distinctive and worthy of specific status. *Miconia friedmaniorum* resembles *M. pendula* in foliar shape and venation and in the details of petal, staminal, and seed morphology. Both species also share an inconspicuous calyx dome that ruptures into rounded hyaline lobes that are largely concealed by the prominent exterior calyx teeth. *Miconia pendula* differs consistently in

several important characters. It has a complex lanate (not asperous) indument on young branchlets, petioles, inflorescence branches, and hypanthia, a mostly pendent modified cyme branched well above the node initiating the inflorescence, and bracts and bracteoles that are pustulate abaxially and invested basally with hairs that are often bifid or irregularly barbed at the apex. Unfortunately, the pustulate nature of the bracts and bracteoles is often distorted by pressing and drying and not always readily observed in herbarium material.

This species is named in honor of Nathan Jay and Virginia Friedman, long-time members of the California Academy of Sciences, in recognition of their exemplary interest and support of botanical exploration and conservation in Costa Rica.

Paratypes. COSTA RICA. ALAJUELA: Monteverde Reserve, Cerro Negro, continental divide, 10°20'N, 84°50'W, 12 Sep. 1985 (fr), *Bello 3242* (CAS, CR, MO); Reserva Forestal de San Ramón, camino de entrada cerca de la estación, 10°13'N, 84°37'W, 6 July 1992 (fl), *Gómez-Laurito 12073* (CR, USJ). ALAJUELA-PUNTARENAS BORDER: Cordillera de Tilarán, Monteverde Reserve, Sendero Brillante along continental divide, 25 Feb. 1992 (fr), *Almeda & Daniel 7074* (CAS, CR). ALAJUELA-GUANACASTE-PUNTARENAS BORDER: Cordillera de Tilarán, Monteverde Reserve, Sendero El Valle, 7 Mar. 1986 (fl), *Almeda & Anderson 5416* (CAS, CR, MO, NY, US); Reserve Monteverde, vertiente Pacífico cerca de división continental (ventana), 31 July 1976 (fr), *Dryer 535* (CR); Reserva Monteverde, vertiente Atlántico, Sendero El Valle, Dec. 1977 (fr), *Dryer 1718* (CR). GUANACASTE: Parque Nacional Rincón de la Vieja, Cabeceras de Quebrada Provisión y Quebrada Rancho Grande, Meseta Aguacatales, 10°46'N, 85°49'W, 1 Dec. 1987 (fr), *Herrera 1465* (CAS, CR, MO).

Miconia pendula Umaña & Almeda, sp. nov.

TYPE: Costa Rica. Cartago: Refugio Nacional de Vida Silvestre Tapantí, orilla de Sendero Los Palmitos, 1,300–1,400 m, 09°44'00"N, 83°47'00"W, 2 Aug. 1990 (fl), *Umaña et al. 391* (holotype, CR; isotypes, BM, BR, CAS, COL, CR, F, MEXU, MO, NY, PMA, US, USJ). Figure 2.

Frutex 4 m. Ramuli sicut petioli foliorum subtus venae primariae inflorescentia hypanthiaque dense setosi pilis 1–3 mm longis et modice pilis amorpho-pinoideis ca. 0.1–0.25 mm longis puberuli. Lamina 10.1–20.3 × 6.4–12.4 cm elliptica vel elliptico-ovata apice acuminata basi obtusa vel asymmetricamente rotundato-obtusa, supra sparse strigosa vel glabrata, subtus in venis secundariis tertiariisque sparse caduceque granuloso-furfuracea, 7-plinervata, membranacea. Inflorescentia 7–11.2 cm longa (pedunculo 0.5–4.7 cm arcuato incluso) multiflora; flores 5(–6)-meri, pedicellis (ad anthesim) 0.5–2.5 mm longis, bracteolis 0.2–0.3 × 0.1–0.2 cm persistentibus. Hypanthium (ad torum) 2–3 mm longum; calyx primum in cono clausus demum in lobos regulares persistentes ruptus, dentibus exterioribus 0.9–1.3 mm eminentibus. Petala 2.5–4 ×

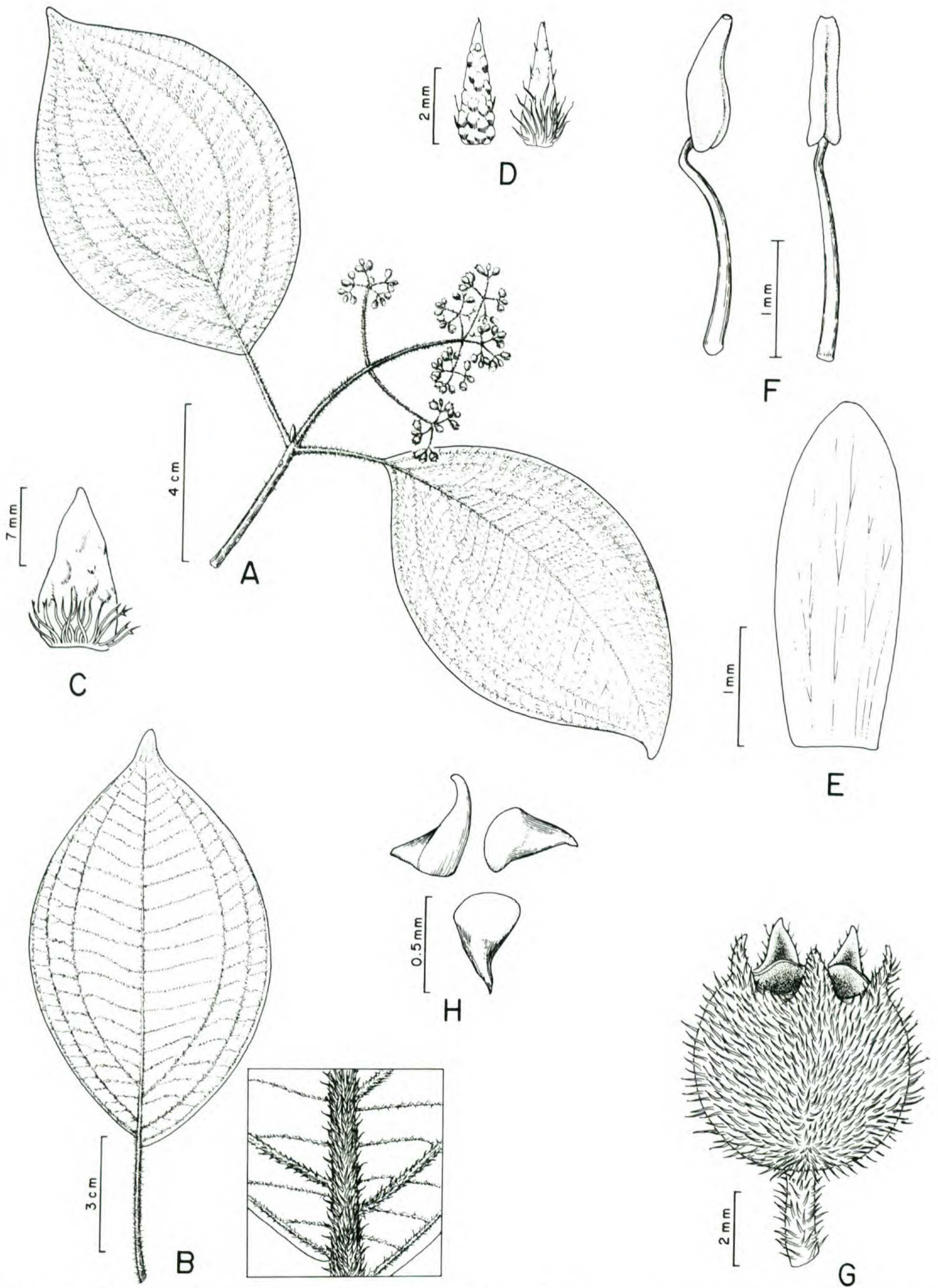


Figure 2. *Miconia pendula* Umaña & Almeda. —A. Habit. —B. Representative leaf, abaxial surface (left) and enlargement of median vein (right). —C. Floral bract (adaxial surface). —D. Bracteoles, abaxial surface (left) and adaxial surface (right). —E. Petal. —F. Stamens, lateral view (left) and ventral view (right). —G. Berry. —H. Seeds. (A–F from Umaña *et al.* 391; G, H from Croat & Grayum 68255.)

1 mm oblongo-elliptica glabra. Stamina isomorphica glabra; antherarum thecae 1.1–1.5 × 0.4–0.5 mm anguste oblongae, poro paulo dorsaliter inclinato; connectivum nec prolongatum nec appendiculatum. Stylus 2.5–5 mm glaber; ovarium 5-loculare et $\frac{2}{3}$ inferum apice sparsiuscule glanduloso-puberulo.

Laxly branched shrub to 4 m tall, young branchlets, petioles of young leaves, and inflorescence rachis moderately to densely covered with a lanate indument of curly or sinuate barbellate or distally bifid multicellular hairs mostly 1–3 mm long that are intermixed with and seemingly grade into a ground layer of shorter amorpho-pinoid multicellular hairs. Older branches somewhat quadrate to rounded with age, bearing conspicuous interpetiolar lines or ridges. Mature leaves membranaceous, inconspicuously denticulate to subentire, 10.1–20.3 cm long, 6.4–12.4 cm wide, elliptic to elliptic-ovate, acuminate apically, obtuse to conspicuously oblique basally, sparingly strigose to glabrous adaxially, lanate on the elevated primaries abaxially and diminutively furfuraceous on prominulous secondary and higher order veins, 7-plinerved with the uppermost primaries typically diverging from the median nerve in alternate or subalternate fashion, the secondaries conspicuous abaxially and mostly 4–8 mm apart; petioles 1.5–9 cm long, 1–2 mm wide. Inflorescence an arcuate or pendent, modified cyme 7–11.2 cm long (including a peduncle 0.5–4.7 cm long) branched well above the base with flowers aggregated into umbelliform clusters; bracts of the rachis nodes paired below but quaternate above, linear-oblong to broadly triangular, 0.2–1.4 cm long, 0.1–0.2 cm wide, sparingly furfuraceous to essentially glabrous or with a few sinuate hairs on the adaxial surface, pustulate proximally on the abaxial surface, bracteoles sessile, persistent, triangular, 0.2–0.3 cm long, 0.1–0.2 cm wide, glabrous and pustulate basally on the abaxial surface. Pedicels 0.5–2.5 mm long, lanate. Hypanthia (at anthesis) campanulate, 2–3 mm long to the torus (vascular ring) with pubescence like that of the petioles. Calyx fused into a dome in bud but rupturing at anthesis into 5 broadly triangular hyaline lobes 0.25–0.50 mm long and 1.25–1.6 mm wide; exterior calyx teeth 5(–6), green (in fruit), narrowly triangular, 0.9–1.3 mm long, exceeding and obscuring the lobes, with pubescence like that of the hypanthia; torus glabrous and undulately lobed adaxially. Petals 5(–6), glabrous, pale pink, linear-oblong, obtuse to rounded apically, 2.5–4 mm long, 1 mm wide. Stamens 10(–12), isomorphic; filaments glabrous, somewhat geniculate distally, 1.2–2 mm long, 0.2–0.25 mm wide; anthers 1.1–1.5 mm long, 0.4–0.5 mm wide, yellow, linear-oblong, apically truncate with a somewhat dorsally inclined pore;

connective thickened dorsally but not prolonged or appendaged at the filament insertion. Ovary (at anthesis) $\frac{2}{3}$ inferior, 5-celled, globose, apex somewhat fluted and sparsely beset with glandular hairs, collar 0.25 mm high. Style somewhat curved distally, glabrous, 2.5–5 mm long, 0.5–0.6 mm wide; stigma truncate and somewhat dilated. Berry globose, pink to red but turning purple when mature, 4–5 mm long, 5 mm diam. Seeds angular-pyramidate to somewhat crescent-shaped in profile view, beige, ca. 0.5 mm long, smooth.

Distribution. Known only from the Tapantí National Wildlife Refuge on the northeastern slopes of the Cordillera de Talamanca and Braulio Carrillo National Park in the Cordillera Central where it occurs in the understory of wet primary forests near streams at elevations of 1,300–1,800 m. *Miconia pendula* may be expected elsewhere along the Atlantic montane corridor of the Cordillera de Talamanca that extends southward to Panama. *Clidemia utleyana* Almeda, *Gonocalyx almedae* Luteyn, *Monochaetum cordatum* Almeda, and *Stemodia reliquiarum* D'Arcy, all of which are known in Costa Rica only from the Tapantí region, have also been collected in western Panama.

Miconia pendula, which was first collected in 1984, is readily overlooked. The flowers are small, the petals fall away quickly, and the leaves are commonly so ravaged by phytophagous insects that collectors may be inclined to pass it up in hopes of finding undamaged material.

Miconia pendula differs from *M. friedmaniorum* in having modally larger 7-plinerved leaves, but its most striking feature is the complex lanate indument of contorted or sinuate multicellular hairs that grade into a ground layer of amorpho-pinoid hairs.

By virtue of their shared seed and petal characters, *M. pendula* and *M. friedmaniorum* appear to be related to a group of three largely Central American species that includes *M. iteophylla* Almeda, *M. ligulata* Almeda, and *M. peltata* Almeda (Almeda, 1989). These three species have rounded-triangular hyaline calyx lobes that are not fused into a rupturing dome as floral buds enlarge. Among this trio of species, the two new taxa described here are perhaps closest to *M. peltata*, which differs most conspicuously in its elliptic-ovate peltate leaves and indument of rusty brown pinoid hairs.

The epithet for this species alludes to the arcuate or nodding posture of the inflorescence.

Paratypes. COSTA RICA. CARTAGO: Tapantí Wildlife Refuge, Sendero Palmito, 5 Mar. 1992 (fr), Almeda et al. 7245 (AAU, CAS, CR, DUKE, F, MO, NY, US); Tapantí Reserve ca. 1 km S of jct. of Quebrada Salta

and Río Grande de Orosi, 9°43'N, 83°47'W, 29 Sep. 1987 (fr), *Croat & Grayum 68255* (CAS, CR, MO); Tapantí Reserve, ca. 1 km upstream from confluence of Quebrada Salta and Río Grande de Orosi, 12 July 1984 (fl), *Grayum & Sleeper 3486* (CAS, CR, MO). HEREDIA: Parque Nacional Braulio Carrillo, San Rafael de Vara Blanca, 10°13'N, 84°06'W, July 1992 (fl), *Ballesteros 157* (CR).

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